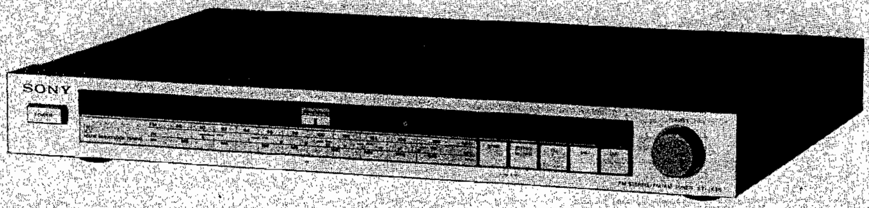
ST-JX3S

5d

E Model



FM STEREO/FM-AM TUNER

SPECIFICATIONS

FM tuner section

Tuning range	87.5 MHz - 108 MHz
Antenna terminals	300-ohm balanced 75-ohm unbalanced
Intermediate frequency	10.7 MHz

	ST-JX3S (at 75 kHz deviation)
Sensitivity	at 50 dB quieting 16.1 dBf, 3.5 μV (mono) 37.9 (35)* dBf, 43 (30)* μV (stereo)
Usable sensitivity	10.3 dBf, 1.8 μV (IHF) —
Limiting threshold	—
Signal-to-noise ratio	85 dB (mono), 80 dB (stereo)
Harmonic distortion at 100 Hz at 1 kHz at 10 kHz	 0.08% (mono), 0.12% (stereo) 0.08% (mono), 0.12% (stereo) 0.1% (mono), 0.2% (stereo)
IM distortion	0.08% (mono), 0.12% (stereo)
Separation at 100 Hz at 1 kHz at 10 kHz	 45 dB 50 dB 40 dB
Frequency response	40 Hz – 12.5 kHz±0.3dB 30 Hz – 15 kHz $^{+0.3}_{-2}$ dB
Selectivity	at 400 kHz 80 dB
Capture ratio	1.0 dB
AM suppression ratio	60 dB
Image response ratio	55 dB
IF response ratio	95 dB
Spurious response ratio	75 dB
RF intermodulation	74 dB (IHF) 88 dB (at 2.4 MHz)
Sub-carrier product ratio	55 dB
Muting threshold	approx. 25.2 dBf, 10 μV
Output level/impedance	750 mV/4.7 k ohms

( )* measured with the SENS switch depressed (ON)

– Continued on page 2 –

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

MICROFILM

SONY®

SERVICE MANUAL

5233

AM tuner section

		MW	SW
Tuning range		522 kHz – 1,602 kHz	5.8 MHz – 15.8 MHz
Antenna	built-in antenna	provided	none
	external antenna terminal	provided	provided
Intermediate frequency		450 kHz	450 kHz
Usable sensitivity	built-in antenna	46 (42)* dB/m (at 1,000 kHz)	—
	external antenna	40 (30)* µV (at 1,000 kHz)	30 (20)* µV (at 12 MHz)
Signal-to-noise ratio		55 (58)* dB	55 (58)* dB
Harmonic distortion		0.3 %	0.4 %
Selectivity		45 dB (9 kHz)	45 dB (9 kHz)
Image response ratio		45 dB (at 1,000 kHz)	—

( )* measured with the SENS switch depressed (ON)

General

System	FM stereo, FM/AM superheterodyne tuner Acute Servo Lock System
Power requirements	110, 120, 220, 240 V ac adjustable, 50/60 Hz
Power consumption	9 W
Dimensions	Approx. 430 × 55 × 337 mm (w/h/d) ($17 \times 2\frac{1}{4} \times 13\frac{1}{4}$ inches) including projecting parts and controls
Weight	Approx. 3.4 kg (7 lbs 8 oz), net Approx. 4.1 kg (9 lbs 1 oz), in shipping carton

Handling Precautions for MOS ICs

Generally, the insulation resistance of the oxide layer in MOS IC structures is very high, and the oxide layer is very thin. Because of this, it is possible that the static voltages usually present on clothes and the human body will be enough to generate a potential difference across the insulator, high enough to cause a breakdown of the insulating layer.

The following precautions should be taken while handling these ICs.

(Particular care should be taken under conditions of low humidity.)

Precautions in Replacing MOS ICs

1. Store new ICs by inserting them into a urethane-polyester cushion (which is somewhat conductive), or wrapping it in aluminum foil, so that all the pins are at the same potential.
   (The ICs should be stored in that manner until mounted on the circuit board.)

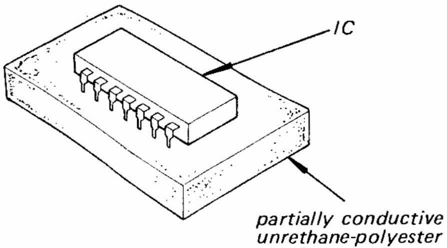

IC
partially conductive unrethane-polyester cushion

Fig. A

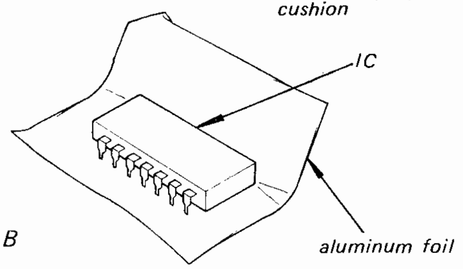

IC
aluminum foil

Fig. B

2. Check the soldering iron for possible power-line leakage current. Make sure that there is no leakage path by connecting an ohmmeter to the tip of the soldering iron and the plug as shown in Fig. C. If there is a leakage path, use some other soldering iron.

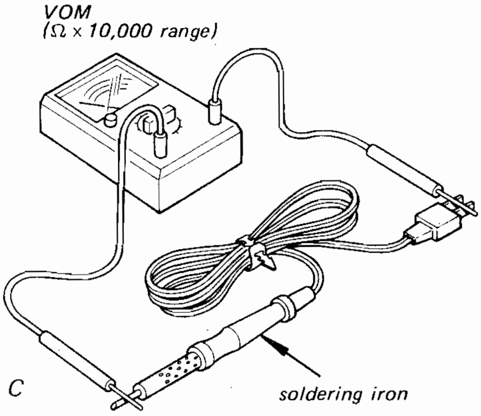

VOM
(Ω x 10,000 range)
soldering iron

Fig. C

3. Equalize any potential difference between the clothes, the tools in use, the work bench, the set being worked on, and the packaged IC by touching them all in succession with the hands or a conductive wire or tool.

4. The following are effective methods for handling ICs that remove the potential difference across the oxide layer.
   - Use a paper clip modified by soldering in a wire braid insert.

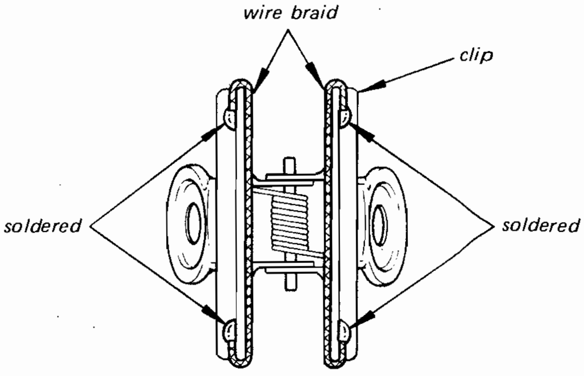

wire braid
clip
soldered
soldered

Fig. D *Make sure that there is no solder on the inside.*

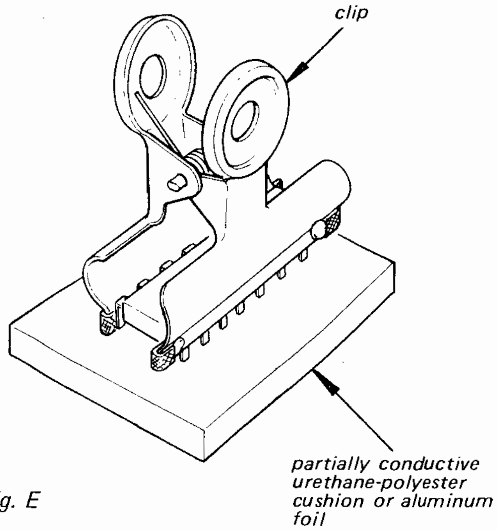

clip
partially conductive urethane-polyester cushion or aluminum foil

Fig. E

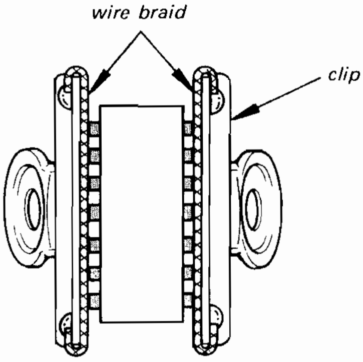

wire braid
clip

Fig. F *Make sure that all the pins are in contact with the wire braid (all the pins will then be at the same potential.).*

- Take a short length of fine bare wire and wind it around the IC so that it shorts all the pins of the IC, while it is still in the urethane-polyester cushion or aluminum foil. This ensures that all the pins are at the same potential.

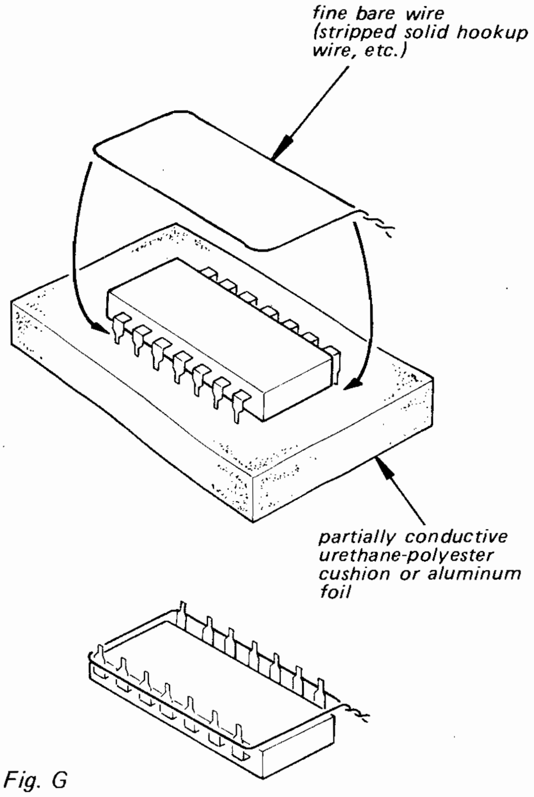

fine bare wire
(stripped solid hookup wire, etc.)
partially conductive urethane-polyester cushion or aluminum foil

Fig. G

- When it is necessary to handle the IC with the fingers, do not touch any pin, and hold the IC at the ends of its plastic-package case as shown in Fig. H.

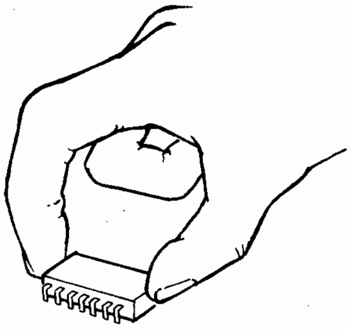


Fig. H

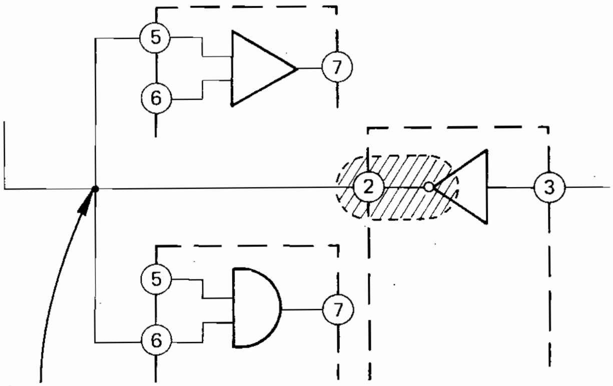
5. Method of Mounting
Insert the IC while holding it with the modified clip, and solder all the pins with the clip still shorting the pins. (Similarly, solder all the pins while the bare shorting wire is still wound around them.). Remove the clip or the bare shorting wire only after all the pins have been soldered.

Precaution while Checking C-MOS ICs

The C-MOS ICs (Complementary MOS) are MOS ICs that have their output sections made up of N-channel and P-channel push-pull stages to increase their speed of operation. If the output terminal of these ICs comes into contact with B+ or B– voltage, then the FET which is ON at that time will either become shorted or open.

This is valid for all the output sections that are connected together by the interconnections. Even the circuits that are physically separated (and not on the same board) can be destroyed simultaneously.

Example:

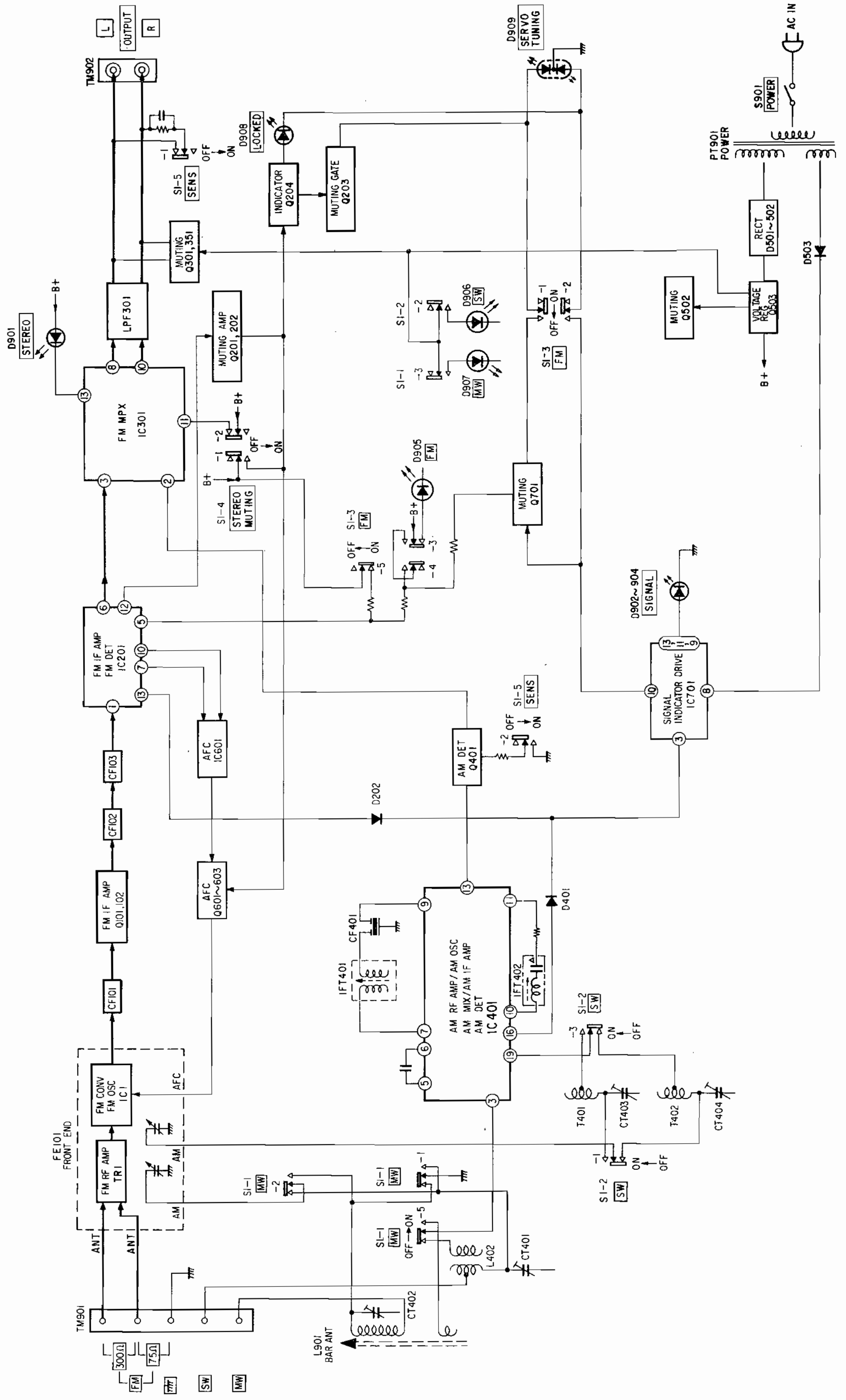


If this line is grounded, or touches B+ or B– bus . . . , the output stage of this IC will be destroyed.

Fig. I

SECTION 1
OUTLINE

1-1. BLOCK DIAGRAM

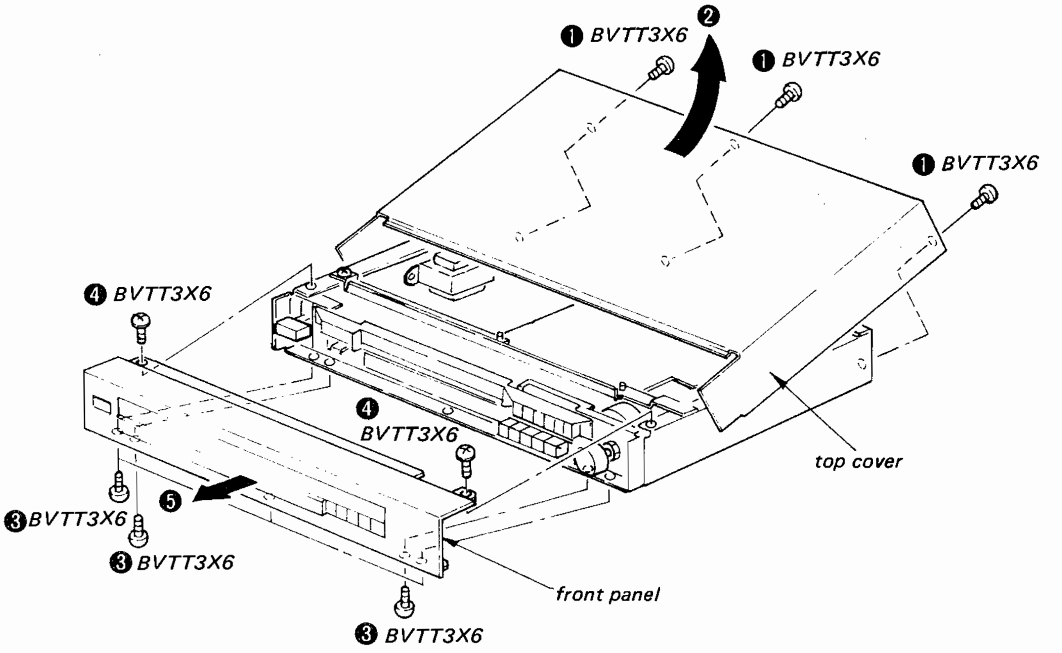

TM902
L
OUTPUT
R
S1-5
SENS
OFF
ON
D908
LOCKED
INDICATOR
Q204
MUTING GATE
Q203
D909
SERVO
TUNING
AC IN
S901
POWER
PT901
POWER
RECT
D501~502
D503
MUTING
Q502
VOLTAGE
REG
Q503
B+
MUTING
Q301, 351
LPF301
D901
STEREO
MUTING AMP
Q201, 202
S1-2
D906
SW
S1-1
D907
MW
S1-3
FM
FM MPX
IC301
S1-4
STEREO
MUTING
D905
FM
MUTING
Q701
D902~904
SIGNAL
SIGNAL
INDICATOR DRIVE
IC701
FM IF AMP
FM DET
IC201
AFC
IC601
AM DET
Q401
CF103
CF102
D202
FM IF AMP
Q101, 102
AFC
Q601~603
D401
CF101
CF401
IFT401
IFT402
AM RF AMP/AM OSC
AM MIX/AM IF AMP
AM DET
IC401
FM CONV
FM OSC
IC1
AFC
FE101
FRONT END
FM RF AMP
TR1
AM
T401
CT403
T402
CT404
ANT
L402
CT401
TM901
CT402
L901
BAR ANT
300Ω
75Ω
FM
SW
MW

SECTION 2
DISASSEMBLY

2-1. REMOVAL

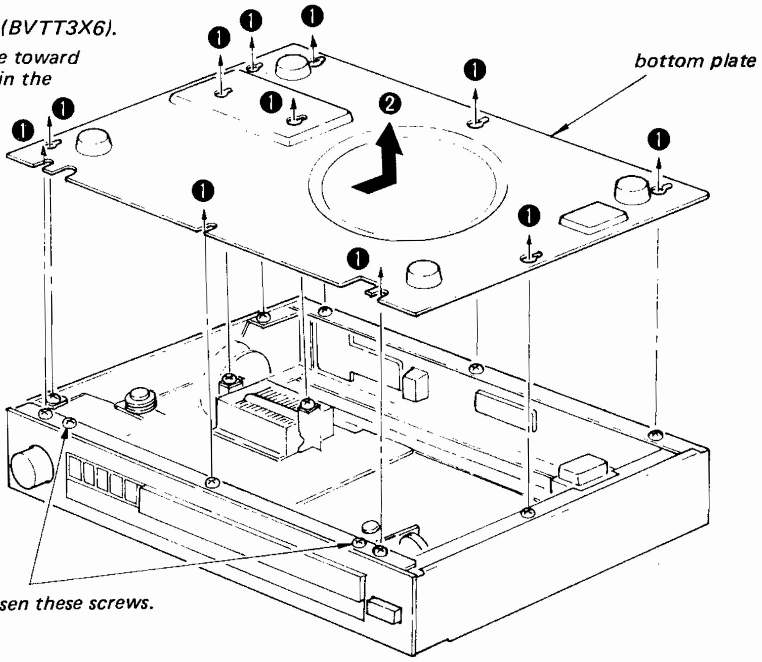
- Follow the disassembly procedure in the numerical order.

TOP COVER/FRONT PANEL


① BVTT3X6
②
① BVTT3X6
① BVTT3X6
④ BVTT3X6
④ BVTT3X6
top cover
⑤
③BVTT3X6
③ BVTT3X6
front panel
③ BVTT3X6

BOTTOM PLATE

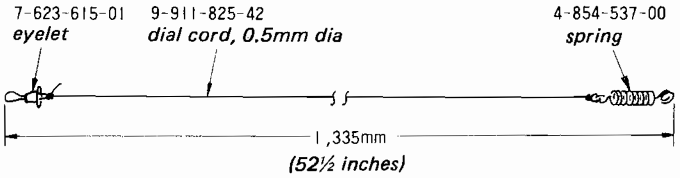
① *Loosen eleven screws (BVTT3X6).*
② *Slide the bottom plate toward the back and remove in the direction of arrow.*


①
①
①
①
①
②
①
①
bottom plate
①
①
①
①
①

**Do not loosen these screws.*

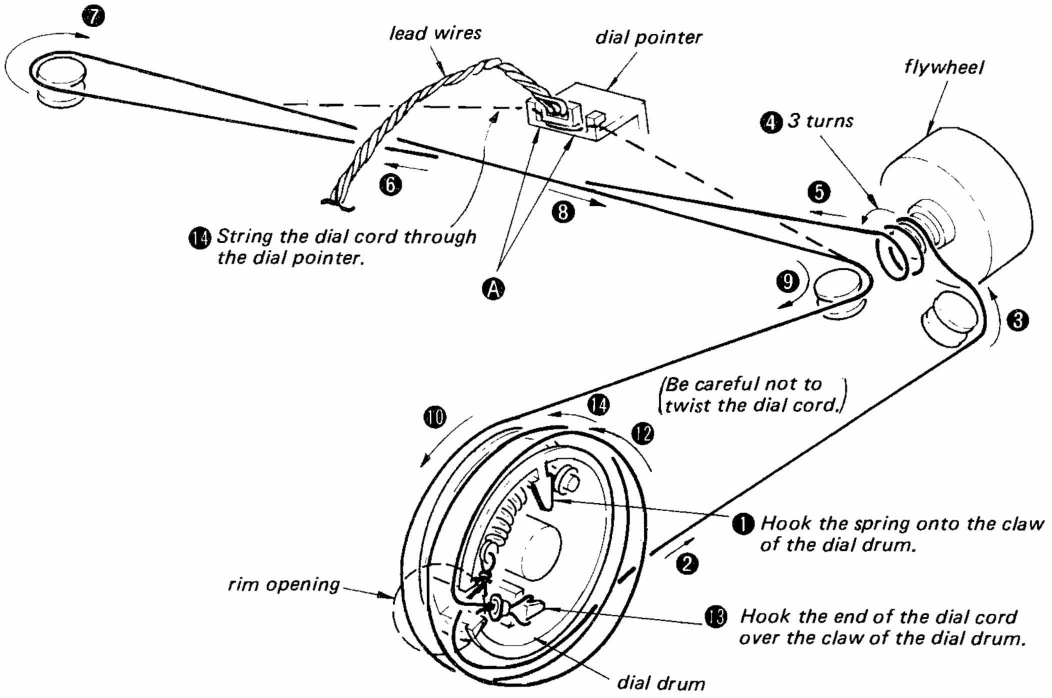
2-2. DIAL CORD STRINGING

1. Preparation


7-623-615-01
eyelet
9-911-825-42
dial cord, 0.5mm dia
4-854-537-00
spring
1,335mm
(52½ inches)

2. Stringing

Turn the turning capacitor shaft fully counterclockwise and set the dial drum so that rim opening is positioned as shown below.


❼
lead wires
dial pointer
flywheel
❹ 3 turns
❺
❻
❽
❾
❸
Ⓐ
❿
⓮
⓬
❷
rim opening
dial drum

⓮ String the dial cord through the dial pointer.

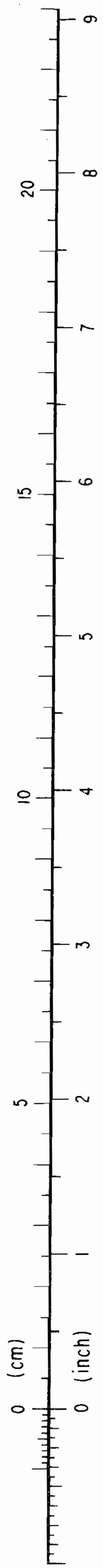
(Be careful not to twist the dial cord.)

❶ Hook the spring onto the claw of the dial drum.

⓭ Hook the end of the dial cord over the claw of the dial drum.

3. Dial Pointer Setting

1. Receive a broadcasting station signal and set the dial pointer on the dial scale.
2. Apply a drop of locking compound to the dial pointer (marked Ⓐ).


9
8
20
7
15
6
5
10
4
3
5
2
1
0 (cm)
0 (inch)

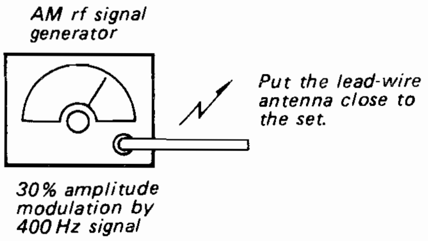
SECTION 3
ADJUSTMENTS

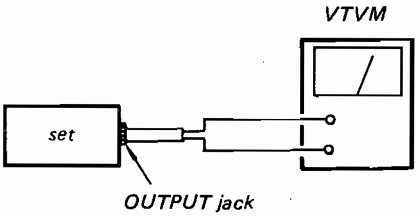
AM SECTION

MW/SW Frequency Coverage and Tracking Adjustments

Setting:

FUNCTION switch: MW or SW

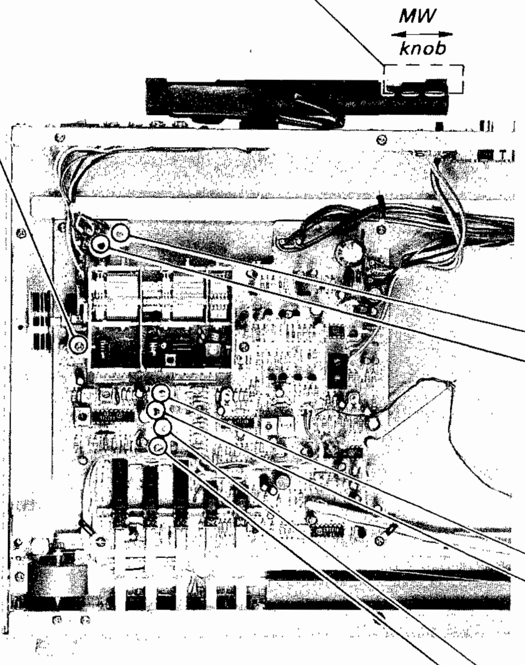

AM rf signal generator
Put the lead-wire antenna close to the set.
30% amplitude modulation by 400 Hz signal


VTVM
set
OUTPUT jack

Note:
- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.
- Set the AM rf signal generator output level as low as possible.
- IFT401 and IFT402 are adjusted in the factory, so no AM IF alignment is necessary.

MW AND SW SECTION

MW TRACKING ADJUSTMENT	
Adjust for maximum reading on VTVM.	
L901	600 kHz
CT402	1,400 kHz



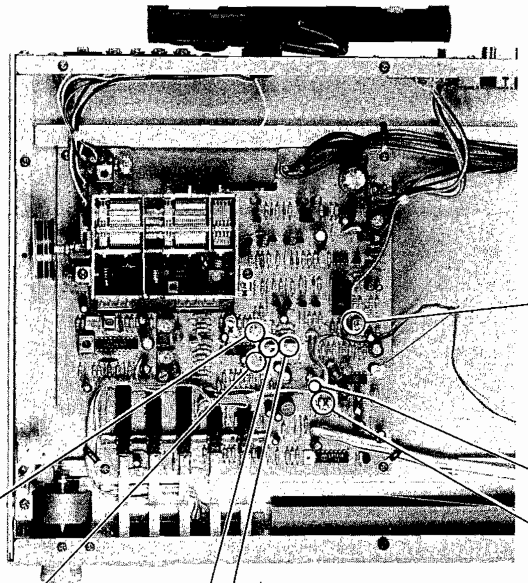
SW TRACKING ADJUSTMENT	
Adjust for maximum reading on VTVM.	
CT401	15 MHz
L402	6 MHz

MW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for maximum reading on VTVM.	
1,660 kHz	CT404
515 kHz	T402

SW FREQUENCY COVERAGE ADJUSTMENT	
Adjust for maximum reading on VTVM.	
16.1 MHz	CT403
5.5 MHz	T401

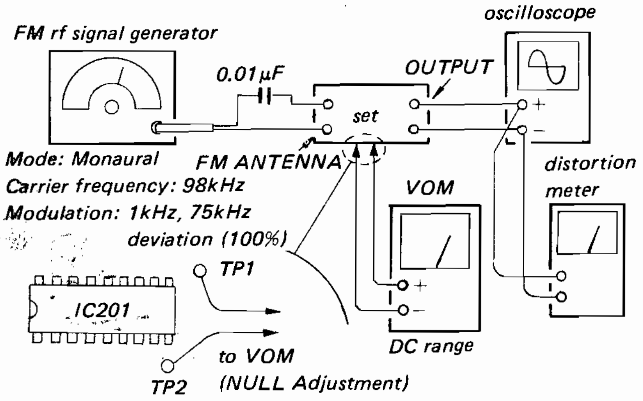
FM SECTION

The FM front-end can not be repaired and it is supplied as the FM front-end block for replacement.


NULL (TP1)
NULL (TP2)
IFT201
IFT202
RT301
VCO (TP3)
RT302

FM Discriminator Adjustment

Setting:

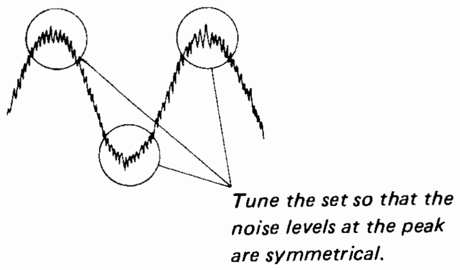

FM rf signal generator
0.01 μF
OUTPUT
oscilloscope
set
FM ANTENNA
VOM
distortion meter
TP1
IC201
to VOM
DC range
TP2
(NULL Adjustment)

Mode: Monaural
Carrier frequency: 98kHz
Modulation: 1kHz, 75kHz deviation (100%)

NULL Adjustment

Procedure:

1. Tune the set so that the noise levels become symmetrical as shown on the right. (output level of the signal generator: 5 ~ 10dB).
2. Adjsut IFT202 so that the noise levels become minimum.
3. Adjust IFT201 for 0V reading on the VOM.
4. If the noise levels are not symmetrical after adjustment in step 3, repeat the steps 1 ~ 3.



Tune the set so that the noise levels at the peak are symmetrical.

Distortion Adjustment

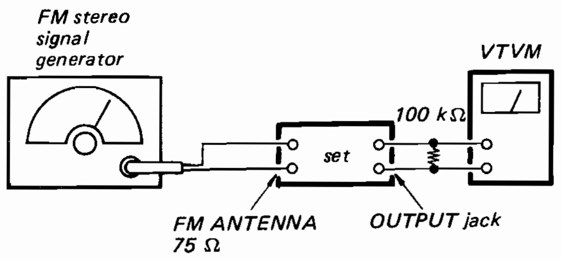
Procedure:

Adjust IFT202 for the minimum distortion on the distortion meter. (output level of the signal generator: 60dB [1mV]).

Note: Repeat the secondary-side and primary-side adjustments several times.
If 0V reading can not be obtained on the VOM after adjustments, repeat the NULL adjustment again.

FM Stereo Separation Adjustment

Procedure:


FM stereo signal generator
VTVM
100 kΩ
set
FM ANTENNA 75 Ω
OUTPUT jack

Carrier frequency: 98 MHz
Output level: 1 mV (60 dB)
Mode: FM Stereo
Modulation:
Audio (1 kHz): 33.75 kHz deviation (45 %)
Pilot (19 kHz): 7.5 kHz deviation (10 %)
Sub channel (38 kHz): 33.75 kHz deviation (45 %)

FUNCTION Switch: FM Stereo

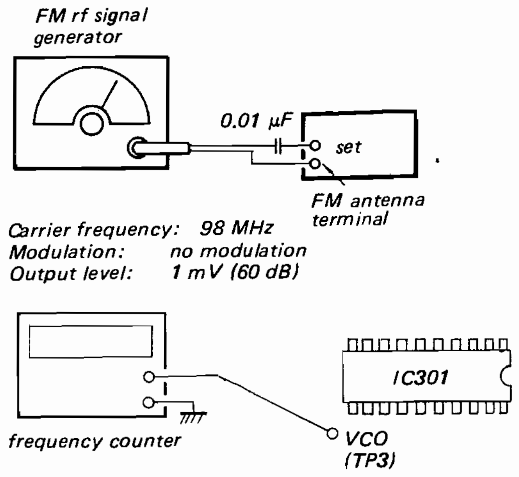
FM stereo signal generator output channel	VTVM connection	VTVM reading
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RT301 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RT301 for minimum reading.

Stereo separation: Ⓐ – Ⓑ , Ⓒ – Ⓓ .
The difference between separations Ⓐ – Ⓑ and Ⓒ – Ⓓ are to be equal.

VCO Adjustment

A) Regular Method

Setting


FM rf signal generator
0.01 μF
set
FM antenna terminal
IC301
frequency counter
VCO (TP3)

Carrier frequency: 98 MHz
Modulation: no modulation
Output level: 1 mV (60 dB)

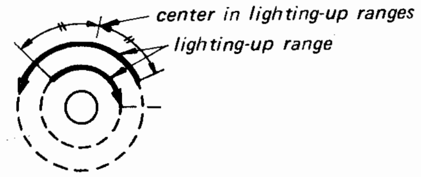
Procedure:

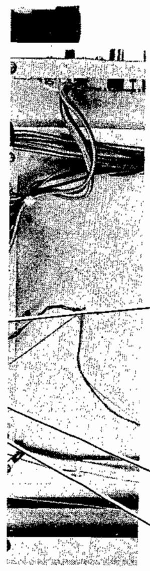
1. Tune the set to 98 MHz.
2. Adjust RT302 for 19 kHz ± 50 Hz on the counter.

B) Simple Method

Procedure:

1. Tune the set to the FM stereo broadcasting signal.
2. Turn **RT302** clockwise or counterclockwise and memorize the lighting-up range of the stereo lamp.
3. Secure **RT302** at the center of the lighting-up range of both turns as shown below.


center in lighting-up ranges
lighting-up range


RT301
VCO
(TP3)
RT302

ıetrical after
s 1 ~ 3.

ɔ that the
the peak
al.

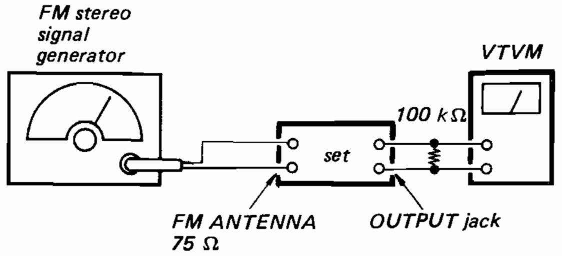
listortion on
ıf the signal

ry-side adjust-

the VOM after
nt again.

FM Stereo Separation Adjustment

Procedure:


FM stereo signal generator
VTVM
100 kΩ
set
FM ANTENNA 75 Ω
OUTPUT jack

Carrier frequency: 98 MHz
Output level: 1 mV (60 dB)
Mode: FM Stereo
Modulation:
Audio (1 kHz): 33.75 kHz deviation (45 %)
Pilot (19 kHz): 7.5 kHz deviation (10 %)
Sub channel (38 kHz): 33.75 kHz deviation (45 %)

FUNCTION Switch: FM Stereo

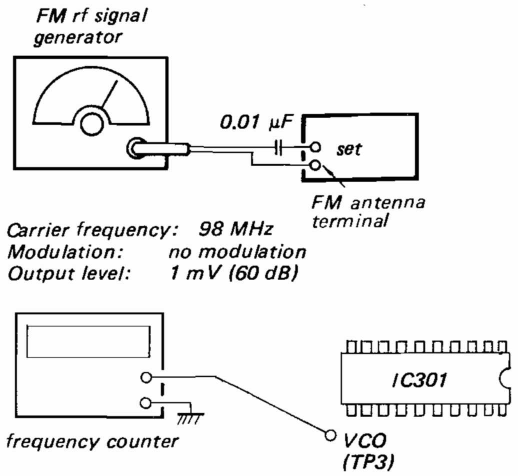
FM stereo signal generator output channel	VTVM connection	VTVM reading
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RT301 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RT301 for minimum reading.

Stereo separation: Ⓐ − Ⓑ , Ⓒ − Ⓓ .
The difference between separations Ⓐ − Ⓑ and Ⓒ − Ⓓ are to be equal.

VCO Adjustment

A) Regular Method

Setting


FM rf signal generator
0.01 μF
set
FM antenna terminal
IC301
frequency counter
VCO
(TP3)

Carrier frequency: 98 MHz
Modulation: no modulation
Output level: 1 mV (60 dB)

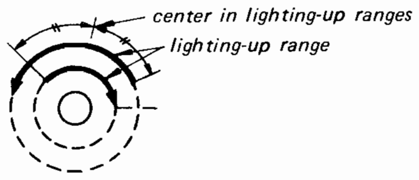
Procedure:

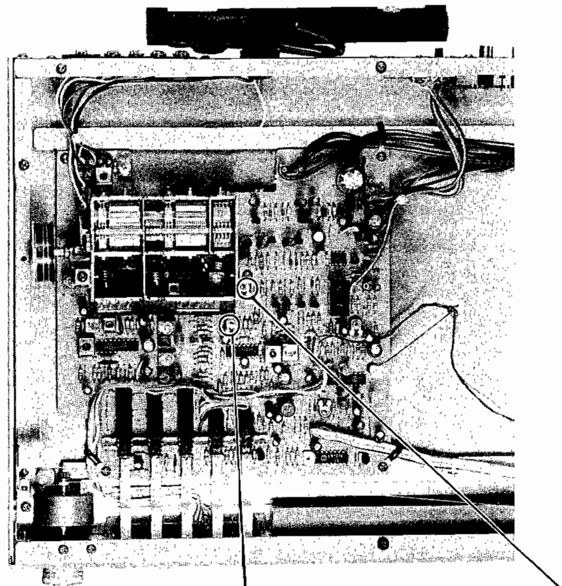
1. Tune the set to 98 MHz.
2. Adjust RT302 for 19 kHz ± 50 Hz on the counter.

B) Simple Method

Procedure:

1. Tune the set to the FM stereo broadcasting signal.
2. Turn **RT302** clockwise or counterclockwise and memorize the lighting-up range of the stereo lamp.
3. Secure **RT302** at the center of the lighting-up range of both turns as shown below.

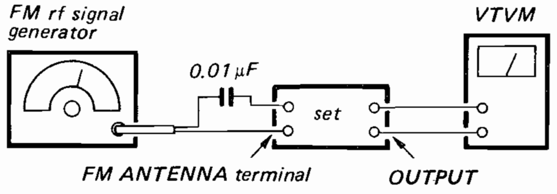

center in lighting-up ranges
lighting-up range


RT202
RT201

FM Muting Level Adjustment

Setting:

STEREO MUTING switch (S1-4): ON


FM rf signal generator
VTVM
0.01 μF
set
FM ANTENNA terminal
OUTPUT

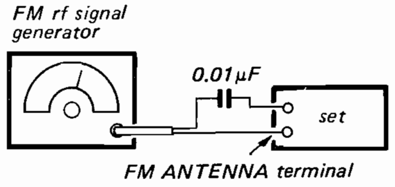
Output level: 10μV (20 dB)

Procedure:

1. Tune the set to 98 MHz by pressing the FM switch (S1-3) and adjust the output level at 20 dB (10 μV).
2. Turn RT202 and stop it just when the VTVM reading becomes suddenly 0 V.

SIGNAL METER ADJUSTMENT

Setting:


FM rf signal generator
0.01 μF
set
FM ANTENNA terminal

Carrier frequency: 98 MHz
Modulation: no modulation
Output level: 0.32 mV (50 dB)

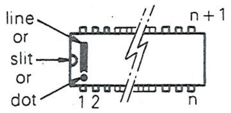
Procedure:

Adjust RT201 so that all LEDs light up.

SECTION 4
DIAGRAMS

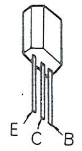
- **Semiconductors Lead Layout**

LA1235
LA3390
LA1245
μPC4558C

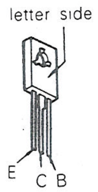

line
or
slit
or
dot
1 2
n
n+1

(Top view)

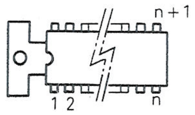
2SA1027R



2SD809-F

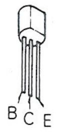

letter side
E
C B

LB1416

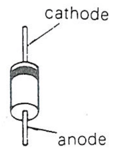


(Top view)

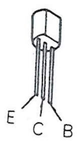
2SC710-15



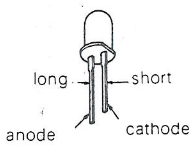
1S1555
10E-2
1T22AM


cathode
anode

2SC1364

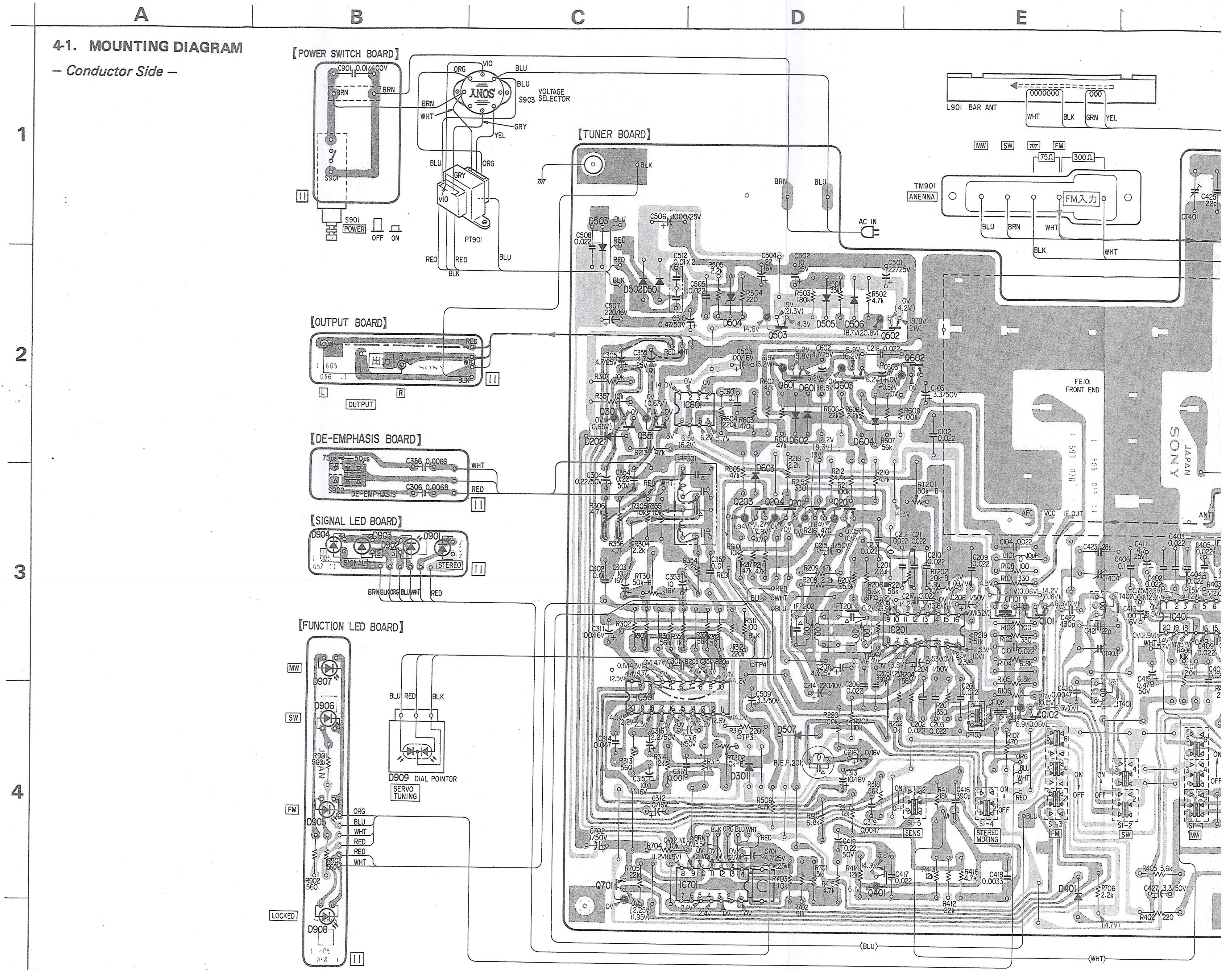


GL-5PR5
GL-5NG10
GL-5HY5


long
short
anode
cathode

4-1. MOUNTING DIAGRAM

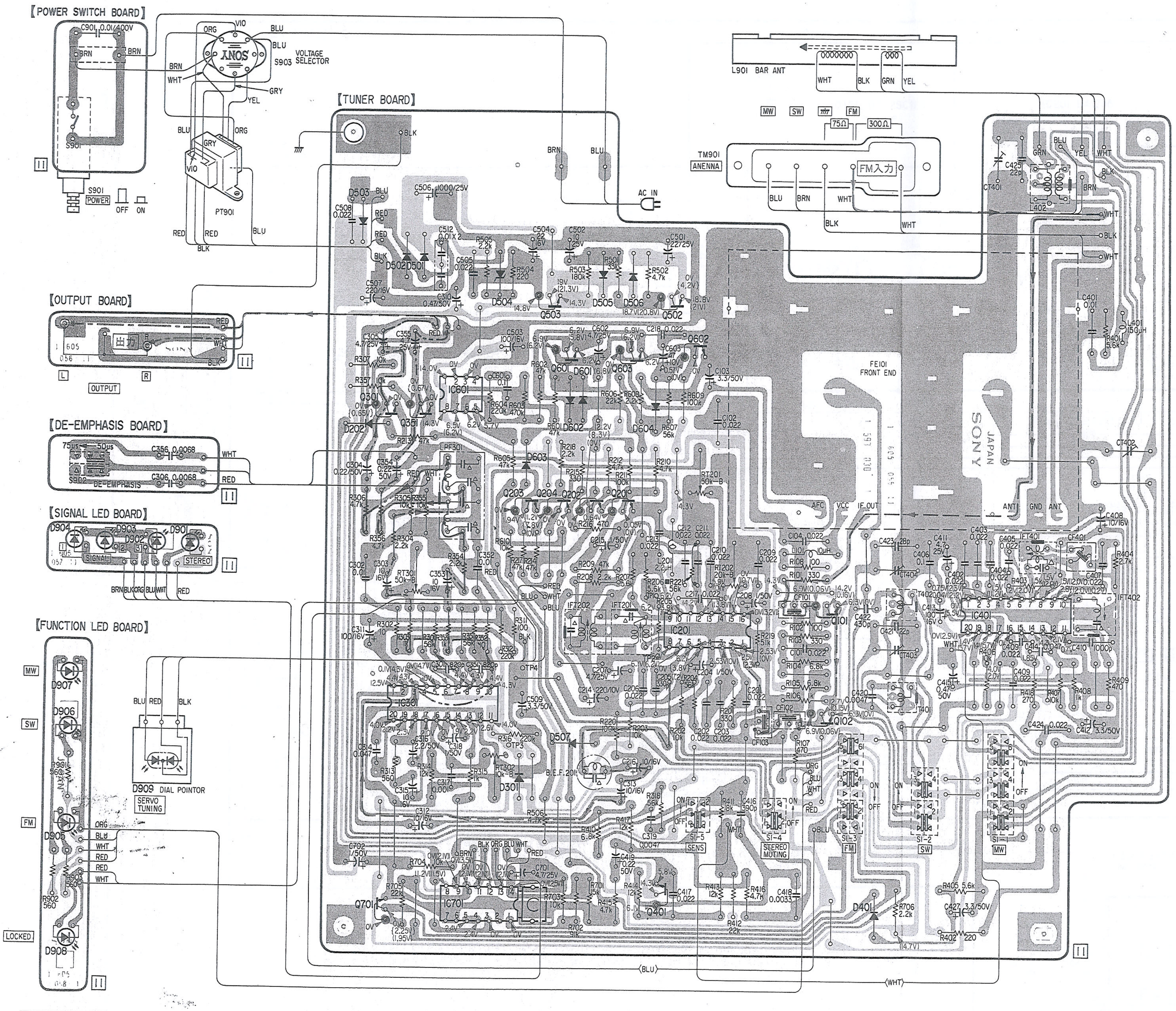
– Conductor Side –


A
B
C
D
E
1
2
3
4
5
[POWER SWITCH BOARD]
C901 0.01/400V
S901 POWER
OFF ON
S903 VOLTAGE SELECTOR
PT901
[OUTPUT BOARD]
OUTPUT
L
R
[DE-EMPHASIS BOARD]
75μs 50μs
C356 0.0068
C306 0.0068
S302 DE-EMPHASIS
[SIGNAL LED BOARD]
D904 D903 D902 D901
STEREO
[FUNCTION LED BOARD]
MW
SW
FM
LOCKED
D907
D906
D905
D908
D909 DIAL POINTER
SERVO TUNING
[TUNER BOARD]
L901 BAR ANT
TM901 ANTENNA
FM入力
75Ω
300Ω
AC IN
FE101 FRONT END
IC601
IC301
IC201
IC701
IC401
Q701
Q401
D401
D507
B.E.F.201
S1-5 SENS
S1-4 STEREO MUTING
S1-3 FM
S1-2 SW
S1-1 MW
BLU
WHT
BRN
RED
BLK
ORG
GRY
YEL
VIO
GRN

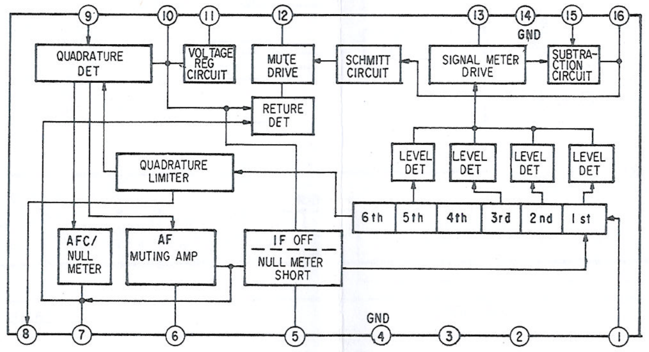
Q・IC	301 351 IC601 IC301 701 IC701 503 601 203, 204, 202, 201 603 502 602 IC201 401 101 102 IC401
D	907 906 905 908 904 903 902 909 901 503 202 502,501 504 603 602,601 301 505,506 507 604 401
ADJ	RT301 RT201 RT202

- ○— : parts extracted from the component side.
- [⁝]← : indicates side identified with part number.
- ▨ : B + pattern
- ━━▶━━ : signal path
- ━━━━▶ : L-CH signal path
- ━ ━ ━▶ : R-CH signal path

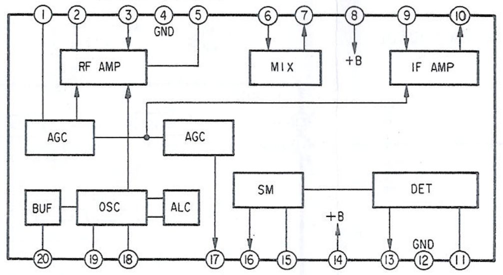
RAM


[POWER SWITCH BOARD]
C901 0.01/400V
S901 POWER
OFF ON
S903 VOLTAGE SELECTOR
PT901
[TUNER BOARD]
AC IN
L901 BAR ANT
TM901 ANTENNA
MW SW FM
75Ω 300Ω
FM入力
[OUTPUT BOARD]
OUTPUT
L R
[DE-EMPHASIS BOARD]
75μs 50μs
S902 DE-EMPHASIS
C356 0.0068
C306 0.0068
[SIGNAL LED BOARD]
D904 D903 D902 D901
SIGNAL STEREO
[FUNCTION LED BOARD]
D907 D906 D905 D908
LOCKED
D909 DIAL POINTER
SERVO TUNING
FE101 FRONT END
SONY JAPAN
IC201 IC301 IC401 IC601 IC701
S1-1 FM S1-2 SW S1-3 S1-4 STEREO MUTING MW SENS
BLK BLU WHT RED GRN YEL BRN ORG GRY VIO

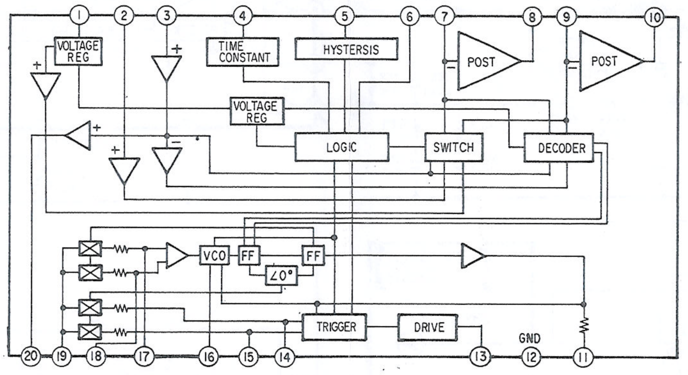
IC 201 LA1235

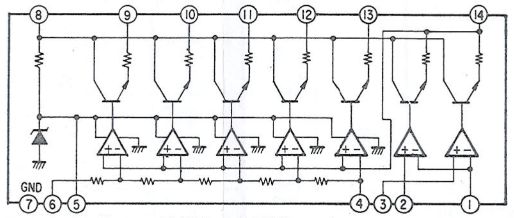

QUADRATURE DET
VOLTAGE REG CIRCUIT
MUTE DRIVE
SCHMITT CIRCUIT
SIGNAL METER DRIVE
SUBTRACTION CIRCUIT
RETURE DET
QUADRATURE LIMITER
LEVEL DET
6th 5th 4th 3rd 2nd 1st
AFC/NULL METER
AF MUTING AMP
IF OFF NULL METER SHORT
GND

IC401 LA1245


GND
RF AMP
MIX
+B
IF AMP
AGC
AGC
SM
DET
BUF
OSC
ALC
GND

IC 301 LA 3390

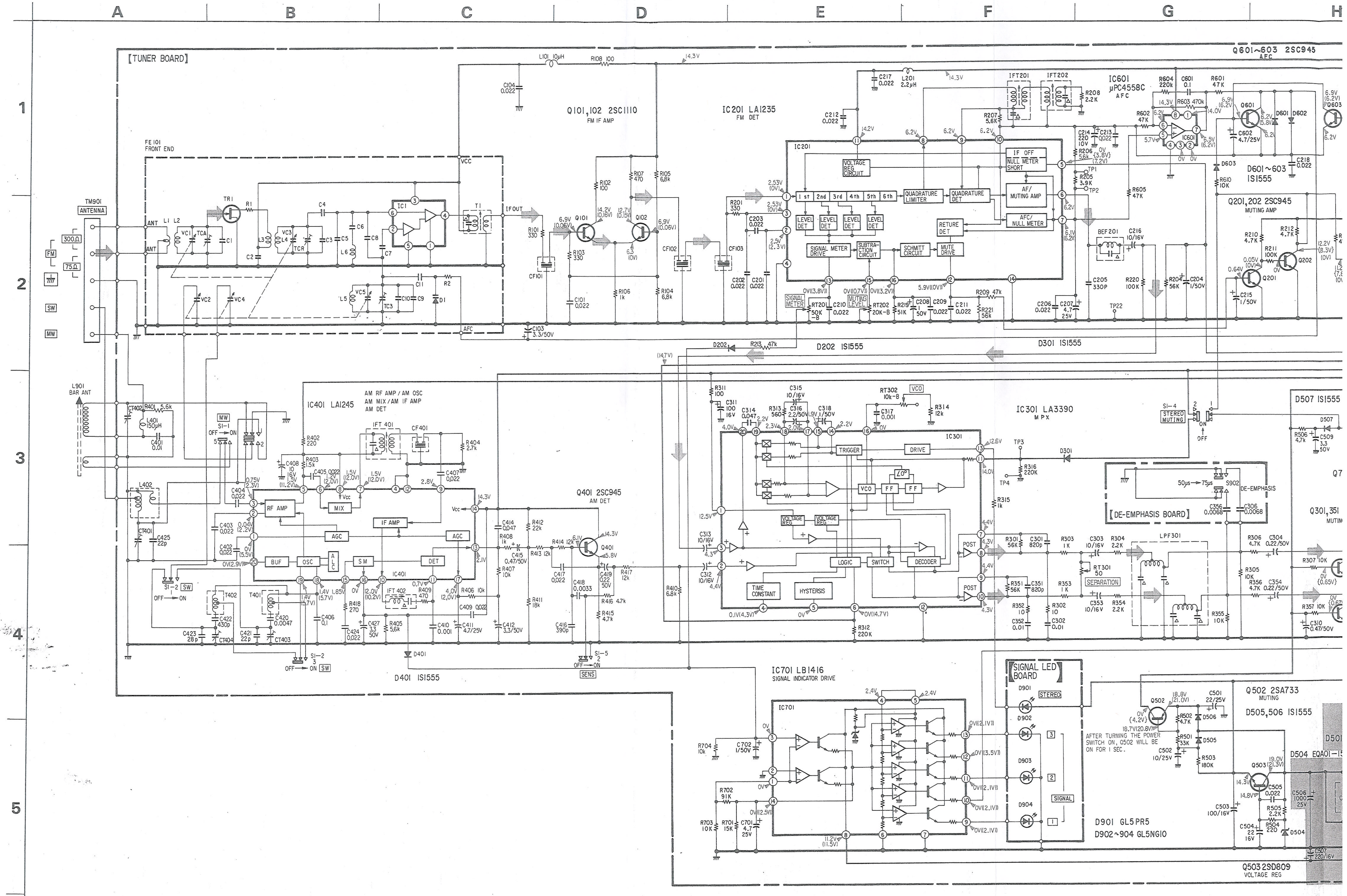

VOLTAGE REG
TIME CONSTANT
HYSTERSIS
POST
POST
VOLTAGE REG
LOGIC
SWITCH
DECODER
VCO FF FF
∠0°
TRIGGER
DRIVE
GND

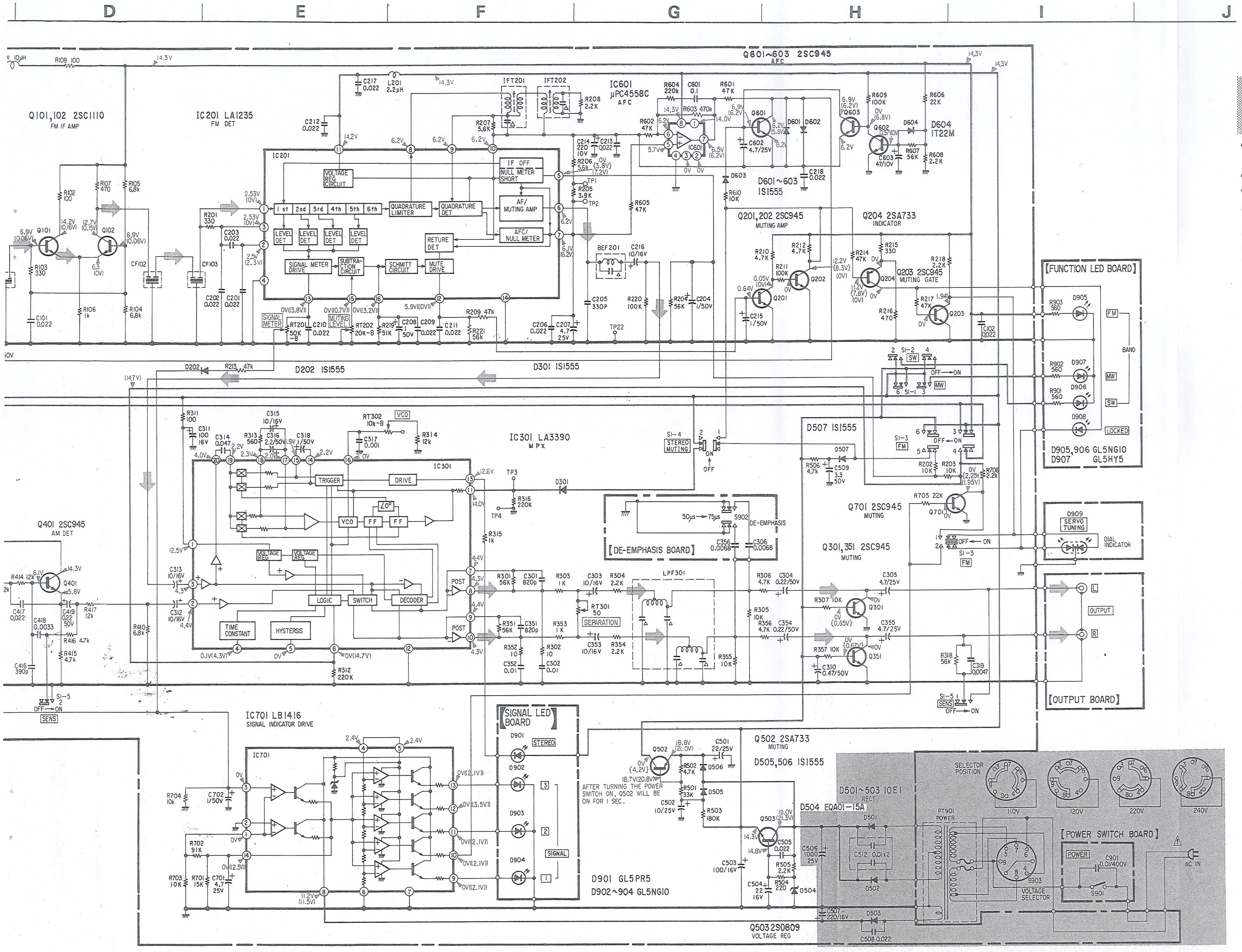


IC 701 LB1416

	B	C	D	E	F	
Q IC		301 351 IC601 IC301 701	503 601 203, 204, 202, 201 603 IC701 502 401	602 IC201 101 102	IC401	Q IC
D	907 906 905 908 904 903 902 901 909	503 502,501 202	504 602,601 505,506 603 301 507 604	401		D
ADJ		RT301		RT201 RT202		ADJ

4-2. SCHEMATIC DIAGRAM


A
B
C
D
E
F
G
H
1
2
3
4
5
[TUNER BOARD]
TM901 ANTENNA
FM 300Ω 75Ω
SW
MW
FE101 FRONT END
Q101,102 2SC1110 FM IF AMP
IC201 LA1235 FM DET
IC601 μPC4558C AFC
Q601~603 2SC945 AFC
D601~603 1S1555
Q201,202 2SC945 MUTING AMP
L901 BAR ANT
IC401 LA1245
AM RF AMP / AM OSC
AM MIX / AM IF AMP
AM DET
Q401 2SC945 AM DET
D401 1S1555
D202 1S1555
D301 1S1555
IC301 LA3390 MPX
S1-4 STEREO MUTING
[DE-EMPHASIS BOARD]
S902 DE-EMPHASIS
50μs→75μs
LPF301
RT301 50 SEPARATION
D507 1S1555
Q301,351 MUTING
IC701 LB1416 SIGNAL INDICATOR DRIVE
[SIGNAL LED BOARD]
D901 STEREO
D902
D903
D904
SIGNAL
D901 GL5PR5
D902~904 GL5NG10
Q502 2SA733 MUTING
D505,506 1S1555
AFTER TURNING THE POWER SWITCH ON, Q502 WILL BE ON FOR 1 SEC.
D504 EQA01-1
Q503 2SD809 VOLTAGE REG
IF OFF NULL METER SHORT
AF/ MUTING AMP
AFC/ NULL METER
QUADRATURE LIMITER
QUADRATURE DET
RETURE DET
SIGNAL METER DRIVE
SUBTRACTION CIRCUIT
SCHMITT CIRCUIT
MUTE DRIVE
VOLTAGE REG CIRCUIT
LEVEL DET
RF AMP
MIX
IF AMP
AGC
BUF
OSC
ALC
SM
DET
TRIGGER
DRIVE
VCO
FF
LOGIC
SWITCH
DECODER
TIME CONSTANT
HYSTERESIS
POST
S1-1 MW
S1-2 SW
S1-3 SW
S1-5 SENS
OFF ON


D
E
F
G
H
I
J
Q101,102 2SC1110
FM IF AMP
IC201 LA1235
FM DET
IC601
μPC4558C
AFC
Q601~603 2SC945
AFC
D604 1T22M
D601~603 1S1555
Q201,202 2SC945
MUTING AMP
Q204 2SA733
INDICATOR
Q203 2SC945
MUTING GATE
IF OFF NULL METER SHORT
VOLTAGE REG CIRCUIT
QUADRATURE LIMITER
QUADRATURE DET
AF/ MUTING AMP
AFC/ NULL METER
RETURE DET
SIGNAL METER DRIVE
SUBTRACTION CIRCUIT
SCHMITT CIRCUIT
MUTE DRIVE
LEVEL DET
IFT201
IFT202
BEF201
D202 1S1555
D301 1S1555
[FUNCTION LED BOARD]
D905,906 GL5NG10
D907 GL5HY5
FM
MW
SW
LOCKED
BAND
IC301 LA3390
MPX
STEREO MUTING
TRIGGER
DRIVE
VCO
FF
LOGIC
SWITCH
DECODER
TIME CONSTANT
HYSTERSIS
VOLTAGE REG
POST
Q401 2SC945
AM DET
D507 1S1555
[DE-EMPHASIS BOARD]
DE-EMPHASIS
50μs—75μs
Q701 2SC945
MUTING
Q301,351 2SC945
MUTING
LPF301
RT301 SEPARATION
D909
SERVO TUNING
DIAL INDICATOR
OUTPUT
L
R
[OUTPUT BOARD]
SENS
IC701 LB1416
SIGNAL INDICATOR DRIVE
[SIGNAL LED BOARD]
STEREO
SIGNAL
D901 GL5PR5
D902~904 GL5NG10
AFTER TURNING THE POWER SWITCH ON, Q502 WILL BE ON FOR 1 SEC.
Q502 2SA733
MUTING
D505,506 1S1555
D501~503 10E1
RECT
D504 EQA01-15A
Q503 2SD809
VOLTAGE REG
SELECTOR POSITION
110V
120V
220V
240V
PT901
POWER
[POWER SWITCH BOARD]
POWER
S903 VOLTAGE SELECTOR
S901
AC IN

> **Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.**

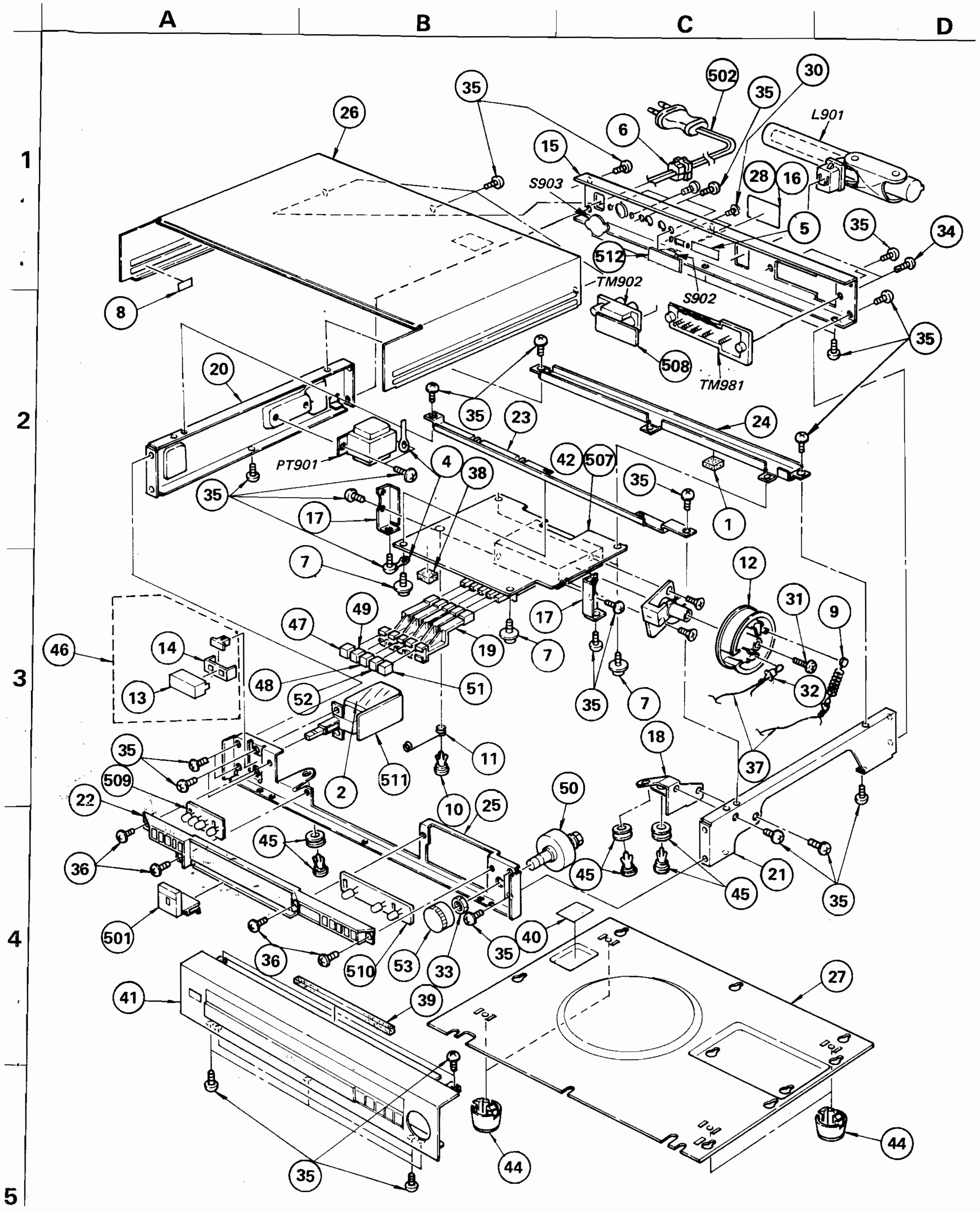
- All resistors are in ohms, ¼W unless otherwise noted.
  kΩ : 1000 Ω; MΩ : 1000 kΩ
- △ : internal component.
- ▭ : panel designation.
- ➡ : signal path
- ▭ : adjustment for repair.
- ——: B+ bus.
- Readings are taken under no-signal conditions with a VOM.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under the following conditions with a VOM (50kΩ/V).
  no mark : FM (detuned condition)
  ( ) : MW, SW (Detuned condition)
  (( )) : FM (Tuned condition)
  { } : FM, STEREO/MUTING switch: ON (Detuned condi

- Switch

Ref. No.	Switch	Position
S1-1	MW	OFF
S1-2	SW	OFF
S1-3	FM	ON
S1-4	STEREO MUTING	OFF
S1-5	SENS	OFF
S901	POWER	OFF
S902	DE-EMPHASIS	50μS

Note: Voltages are measured with a VOM (50kΩ/V).

SECTION 5
EXPLODED VIEW AND PARTS LIST



GENERAL SECTION

No.	Part No.	Description
1 ●;	3-455-060-00	CUSHION
2	* * * * * *	
3	* * * * * *	
4	3-701-822-00	HOLDER, WIRE
5	* * * * * *	
6 ⚠	3-703-244-00	BUSHING, CORD
7	3-703-249-01	SCREW, S TIGHT, +PTTWH 3X6
8	3-831-441-XX	CUSHION
9	4-809-050-00	SPRING, TENSION
10	4-812-134-11	RIVET NYLON, 3.5
11 ●;	4-838-818-00	LEAD, CLAMP INDICATOR
12	4-859-586-01	DRUM (165), DIAL
13	4-871-322-01	CAP, POWER KNOB
14	4-871-323-00	BASE, POWER KNOB
15 ●;	4-875-003-01	PLATE, JACK
16 ●;	4-875-007-00	(E1)···LABEL, MODEL NUMBER (MADE IN KOREA)
17 ●;	4-875-010-00	SUPPORT, VC
18 ●;	4-875-013-00	BRACKET, PULLEY
19	4-875-015-00	JOINT
20 ●;	4-875-017-00	PLATE (L), SIDE
21 ●;	4-875-018-00	PLATE (R), SIDE
22	4-875-021-00	PLATE, BACK
23 ●;	4-875-022-00	BRACKET (B), CHASSIS
24 ●;	4-875-023-00	BRACKET (A), CHASSIS
25	4-875-025-00	PANEL, SUB
26	4-875-026-01	CASE
27 ●;	4-875-027-00	PLATE, BOTTOM
28	4-875-035-00	(E2)···LABEL, MODEL NUMBER (MADE IN KOREA)
29	* * * * * *	
30	7-621-255-25	+P2×4
31	7-621-759-45	+PSW, 2.6X6
32	7-623-615-01	EYELET, 2X2
33	7-684-024-04	N 4, TYPE 2
34	7-685-647-11	SCREW +BVTP 3X10 TYPE2 N-S
35	7-685-871-01	SCREW +BVTT 3X6 (S)
36	7-685-871-09	SCREW +BVTT 3X6 (S)
37	9-911-825-42	STRING, 0.5MM WHITE
38	9-911-843-XX	CUSHION, FLYWHEEL
39	9-911-845-XX	CUSHION
40	9-911-863-XX	INSULATOR
41	A-4322-331-A	PANEL ASSY
42 ●;	A-4351-271-A	MOUNTED PCB, TUNER
43	* * * * * *	
44	X-3701-069-0	FOOT ASSY, M.F
45	X-3701-109-0	PULLEY ASSY

GENERAL SECTION

No.	Part No.	Description
46	X-4871-302-0	KNOB ASSY, POWER
47	X-4875-001-0	KNOB (SENS) ASSY, PUSH
48	X-4875-003-0	KNOB (FM) ASSY, PUSH
49	X-4875-004-0	KNOB (MUTING) ASSY, PUSH
50 ●;	X-4875-006-0	WHEEL ASSY, TUNING
51	X-4875-010-0	KNOB (SW),ASSY, PUSH
52	X-4875-009-0	KNOB (MW) ASSY, PUSH
53	X-4875-113-2	KNOB (DIA. 24) (A) ASSY, R

ACCESSORY & PACKING MATERIAL

No.	Part No.	Description
	1-501-161-00	ANTENNA,FEEDER
⚠	1-526-565-00	(E1)·····AC PLUG ADAPTER
	1-551-734-21	CORD, CONNECTION (RK- 74A)
	3-701-630-00	BAG, POLYETHYLENE
	3-783-511-11	MANUAL, INSTRUCTION
	4-875-035-00	HOLDER, MASTER
	4-875-048-00	INDIVIDUAL CARTON (MADE IN JAPAN)
	4-875-040-00	SHEET, PROTECTION
	4-875-049-00	INDIVIDUAL CARTON (MADE IN KOREA)
	4-875-042-00	CUSHION, LOWER
	4-875-043-00	CUSHION, UPPER

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked " ● " are not stocked since thev are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

COILS
- MMH : mH, UH : μH

Ref.No.
501
502 ⚠
503 ●;
504 ●;
505 ●;
506
507 ●;
508 ●;
509 ●;
510 ●;
511 ●;
512 ●;
BEF201
C506 ⚠
C507 ⚠
C508 ⚠
C512 ⚠
C901 ⚠
CF101
CF102
CF103
CF401
CT401
CT402
CT403
CT404
D202
D301
D401
D501 ⚠
D502 ⚠
D503 ⚠
D504
D505
D506
D507
D601
D602
D603
D604
D901
D902
D903
D904
D905
D906
D907
D908
FE101

NOTE:
- Items with no par
cription are not
are seldom requir
- Items marked " ●
thev are seldom r
service. Some de
pated when orderi
- Due to standardiz
numbers (Δ-ΔΔΔ-ΔΔ
may be different
set.

GENERAL SECTION

No.	Part No.	Description
1	●;3-455-060-00	CUSHION
2	* * * * * *	
3	* * * * * *	
4	3-701-822-00	HOLDER, WIRE
5	* * * * * *	
6	⚠ 3-703-244-00	BUSHING, CORD
7	3-703-249-01	SCREW, S TIGHT, +PTTWH 3X6
8	3-831-441-XX	CUSHION
9	4-809-050-00	SPRING, TENSION
10	4-812-134-11	RIVET NYLON, 3.5
11	●;4-838-818-00	LEAD, CLAMP INDICATOR
12	4-859-586-01	DRUM (165), DIAL
13	4-871-322-01	CAP, POWER KNOB
14	4-871-323-00	BASE, POWER KNOB
15	●;4-875-003-01	PLATE, JACK
16	●;4-875-007-00	(E1)…LABEL, MODEL NUMBER (MADE IN KOREA)
17	●;4-875-010-00	SUPPORT, VC
18	●;4-875-013-00	BRACKET, PULLEY
19	4-875-015-00	JOINT
20	●;4-875-017-00	PLATE (L), SIDE
21	●;4-875-018-00	PLATE (R), SIDE
22	4-875-021-00	PLATE, BACK
23	●;4-875-D22-00	BRACKET (B), CHASSIS
24	●;4-875-023-00	BRACKET (A), CHASSIS
25	4-875-025-00	PANEL, SUB
26	4-875-026-01	CASE
27	●;4-875-027-00	PLATE, BOTTOM
28	4-875-035-00	(E2)…LABEL, MODEL NUMBER (MADE IN KOREA)
29	* * * * * *	
30	7-621-255-25	+P2×4
31	7-621-759-45	+PSW, 2.6X6
32	7-623-615-01	EYELET, 2X2
33	7-684-024-04	N 4, TYPE 2
34	7-685-647-11	SCREW +BVTP 3X10 TYPE2 N-S
35	7-685-871-01	SCREW +BVTT 3X6 (S)
36	7-685-871-09	SCREW +BVTT 3X6 (S)
37	9-911-825-42	STRING, 0.5MM WHITE
38	9-911-843-XX	CUSHION, FLYWHEEL
39	9-911-845-XX	CUSHION
40	9-911-863-XX	INSULATOR
41	A-4322-331-A	PANEL ASSY
42	●;A-4351-271-A	MOUNTED PCB, TUNER
43	* * * * * *	
44	X-3701-069-0	FOOT ASSY, M.F
45	X-3701-109-0	PULLEY ASSY
46	X-4871-302-0	KNOB ASSY, POWER
47	X-4875-001-0	KNOB (SENS) ASSY, PUSH
48	X-4875-003-0	KNOB (FM) ASSY, PUSH
49	X-4875-004-0	KNOB (MUTING) ASSY, PUSH
50	●;X-4875-006-0	WHEEL ASSY, TUNING
51	X-4875-010-0	KNOB (SW),ASSY, PUSH
52	X-4875-009-0	KNOB (MW) ASSY, PUSH
53	X-4875-113-2	KNOB (DIA. 24) (A) ASSY, R

ACCESSORY & PACKING MATERIAL

No.	Part No.	Description
	1-501-161-00	ANTENNA,FEEDER
	⚠ 1-526-565-00	(E1)……AC PLUG ADAPTER
	1-551-734-21	CORD, CONNECTION (RK- 74A)
	3-701-630-00	BAG, POLYETHYLENE
	3-783-511-11	MANUAL, INSTRUCTION
	4-875-035-00	HOLDER, MASTER
	4-875-048-00	INDIVIDUAL CARTON (MADE IN JAPAN)
	4-875-040-00	SHEET, PROTECTION
	4-875-049-00	INDIVIDUAL CARTON (MADE IN KOREA)
	4-875-042-00	CUSHION, LOWER
	4-875-043-00	CUSHION, UPPER

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked " ● " are not stocked since thev are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

COILS
- MMH : mH, UH : μH

ELECTRICAL PARTS

Ref.No.	Part No.	Description
501	1-518-468-21	POINTER, DIAL (D909)
502	⚠ 1-551-473-31	CORD, POWER
503	●;1-535-116-00	TERMINAL
504	●;1-535-117-00	TERMINAL
505	●;1-535-139-00	BASE POST 19MM (10MM PITCH)
506	* * * * * *	
507	●;1-605-986-00	PC BOARD, TUNER
508	●;1-605-987-00	PC BOARD, OUTPUT
509	●;1-605-988-00	PC BOARD, SIGNAL LED
510	●;1-605-989-00	PC BOARD, FUNCTION LED
511	●;1-605-990-00	PC BOARD, POWER SWITCH
512	●;1-605-991-00	PC BOARD, DE-EMPHASIS
BEF201	1-235-069-00	ENCAPSULATED COMPONENT (B.E.F)
C506	⚠ 1-123-337-00	ELECT 1000MF 20% 25V
C507	⚠ 1-123-321-00	ELECT 220MF 20% 16V
C508	⚠ 1-161-051-11	CERAMIC 0.022MF 30% 25V
C512	⚠ 1-102-394-00	CERAMIC 0.01MF+0.01MF 250V
C901	⚠ 1-161-744-00	CERAMIC 0.01MF 400V
CF101	1-527-344-91	FILTER, CERAMIC
CF102	1-527-344-91	FILTER, CERAMIC
CF103	1-527-344-91	FILTER, CERAMIC
CF401	1-527-826-00	FILTER, CERAMIC
CT401	1-141-180-00	CAP,TRIMMER
CT402	1-141-180-00	CAP,TRIMMER
CT403	1-141-180-00	CAP,TRIMMER
CT404	1-141-180-00	CAP,TRIMMER
D202	8-719-815-55	DIODE 1S1555
D301	8-719-815-55	DIODE 1S1555
D401	8-719-815-55	DIODE 1S1555
D501	⚠ 8-719-200-02	DIODE 10E-2
D502	⚠ 8-719-200-02	DIODE 10E-2
D503	⚠ 8-719-200-02	DIODE 10E-2
D504	8-719-931-15	DIODE EQA01-15
D505	8-719-815-55	DIODE 1S1555
D506	8-719-815-55	DIODE 1S1555
D507	8-719-815-55	DIODE 1S1555
D601	8-719-815-55	DIODE 1S1555
D602	8-719-815-55	DIODE 1S1555
D603	8-719-815-55	DIODE 1S1555
D604	8-719-422-21	DIODE 1T22AM
D901	8-719-900-56	DIODE GL-5PR5
D902	8-719-951-00	DIODE GL-5NG10
D903	8-719-951-00	DIODE GL-5NG10
D904	8-719-951-00	DIODE GL-5NG10
D905	8-719-951-00	DIODE GL-5NG10
D906	8-719-951-00	DIODE GL-5NG10
D907	8-719-951-00	DIODE GL-5NG10
D908	8-719-900-57	DIODE GL-5HY5
FE101	1-463-358-00	FRONT END
IC201	8-759-812-35	IC LA1235
IC301	8-759-833-90	IC LA3390
IC401	8-759-812-45	IC LA1245
IC601	8-759-145-58	IC UPC4558C
IC701	8-759-814-16	IC LB1416
IFT201	1-404-327-00	TRANSFORMER, DISCRIMINATOR
IFT202	1-404-328-00	TRANSFORMER, DISCRIMINATOR
IFT401	1-404-326-00	TRANSFORMER, IF
IFT402	1-404-220-00	COIL
L101	1-408-117-00	MICRO INDUCTOR 10UH
L201	1-408-109-00	MICRO INDUCTOR 2.2UH
L401	1-407-752-00	MICRO INDUCTOR 150UH
L402	1-401-896-00	COIL, ANTENNA(SW)
L901	1-401-905-00	ANTENNA, FERRITE-ROD (MW)
LPF301	1-235-045-00	ENCAPSULATED COMPONENT (L.P.F)
PT901	⚠ 1-447-111-00	TRANSFORMER, POWER
Q101	8-729-671-15	TRANSISTOR 2SC710-15
Q102	8-729-671-15	TRANSISTOR 2SC710-15
Q201	8-729-663-47	TRANSISTOR 2SC1364
Q202	8-729-663-47	TRANSISTOR 2SC1364
Q203	8-729-663-47	TRANSISTOR 2SC1364
Q204	8-729-612-77	TRANSISTOR 2SA1027R
Q301	8-729-663-47	TRANSISTOR 2SC1364
Q351	8-729-663-47	TRANSISTOR 2SC1364
Q401	8-729-663-47	TRANSISTOR 2SC1364
Q502	8-729-612-77	TRANSISTOR 2SA1027R
Q503	8-729-180-93	TRANSISTOR 2SD809-F
Q601	8-729-663-47	TRANSISTOR 2SC1364
Q602	8-729-663-47	TRANSISTOR 2SC1364
Q603	8-729-663-47	TRANSISTOR 2SC1364
Q701	8-729-663-47	TRANSISTOR 2SC1364
RT201	1-226-238-00	RES, ADJ, CARBON 50K
RT202	1-226-237-00	RES, ADJ, CARBON 20K
RT301	1-226-238-00	RES, ADJ, CARBON 50K
RT302	1-226-236-00	RES, ADJ, CARBON 10K
S1-1 5	1-553-752-00	SWITCH, PUSH (5 KEY)
S901	⚠ 1-553-318-00	SWITCH, PUSH (AC POWER)
S902	1-553-446-00	SWITCH, SLIDE (DE-EMPHASIS)
S903	⚠ 1-552-963-00	VOLTAGE SELECTOR
T401	1-405-965-00	COIL (OSC)
T402	1-405-953-00	COIL (OSC)
TM901	1-536-664-00	TERMINAL BOARD (ANTENNA)
TM902	1-507-699-00	JACK, PIN 2P

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- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

COILS
- MMH : mH, UH : μH

ELECTROLYTIC CAPACITORS

CAP. (μF)	RATING				→: Use the high voltage rated one.	
	6.3 VOLT.	10 VOLT.	16 VOLT.	25 VOLT.	35 VOLT.	50 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.47					→	1-121-726-00
1.0					→	1-121-391-00
2.2					→	1-121-450-00
3.3	→	→	→	1-121-392-00	→	1-121-393-00
4.7	→	→	→	1-121-395-00	→	1-121-396-00
10	→	→	1-121-651-00	1-121-398-00	→	1-121-738-00
22	→	→	1-121-479-00	1-121-480-00	1-121-662-00	1-121-152-00
33	→	→	1-121-403-00	1-121-404-00	1-121-652-00	1-121-405-00
47	→	1-121-352-00	1-121-409-00	1-121-410-00	1-121-653-00	1-121-411-00
100	→	1-121-414-00	1-121-415-00	1-121-416-00	1-121-357-00	1-121-417-00
220	1-121-419-00	1-121-420-00	1-121-421-00	1-121-422-00	1-121-261-00	1-121-423-00
330	1-121-751-00	1-121-805-00	1-121-521-00	1-121-654-00	1-121-655-00	1-121-656-00
470	1-121-424-00	1-121-425-00	1-121-426-00	1-121-733-00	1-121-361-00	1-121-810-00
1000	–	1-121-736-00	1-121-245-00	1-121-657-00	1-121-388-00	1-123-061-00
2200	1-121-658-00	1-121-659-00	1-121-660-00	1-123-067-00	1-121-984-00	–
3300	1-121-661-00	1-123-075-00	1-123-071-00	–	–	–

CAP. (μF)	100 VOLT.	160 VOLT.	250 VOLT.	350 VOLT.
	PART No.	PART No.	PART No.	PART No.
0.47	–	–	–	–
1.0	1-123-249-00	1-123-252-00	1-123-003-00	1-121-168-00
2.2	1-123-250-00	1-123-026-00	–	1-123-028-00
3.3	1-121-995-00	–	1-123-004-00	1-123-006-00
4.7	1-123-255-00	1-121-246-00	1-121-759-00	1-123-007-00
10	1-121-126-00	1-121-999-00	1-123-254-00	1-123-008-00
22	1-121-996-00	1-123-253-00	1-123-005-00	1-123-022-00
33	1-121-997-00	1-121-757-00	–	–
47	1-123-251-00	1-121-919-00	–	–
100	1-123-084-00	–	–	–

CERAMIC CAPACITORS

			RATING				
CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (μF)	50 VOLT.
	PART No.		PART No.		PART No.		PART No.
0.5	1-101-837-00	22	1-102-959-00	150	1-101-361-00	0.001	1-102-074-00
0.75	1-101-586-00	24	1-102-960-00	160	1-101-367-00	0.0012	1-102-118-00
1.0	1-102-934-00	27	1-102-961-00	180	1-102-976-00	0.0015	1-102-119-00
1.5	1-101-576-00	30	1-102-962-00	200	1-102-977-00	0.0018	1-102-120-00
2.0	1-102-935-00	33	1-102-963-00	220	1-102-978-00	0.0022	1-102-121-00
3	1-102-936-00	36	1-102-964-00	240	1-102-979-00	0.0027	1-102-122-00
4	1-102-937-00	39	1-102-965-00	270	1-102-980-00	0.0033	1-102-123-00
5	1-102-942-00	43	1-102-966-00	300	1-102-981-00	0.0039	1-102-124-00
6	1-102-943-00	47	1-101-880-00	330	1-102-820-00	0.0047	1-102-125-00
7	1-102-944-00	51	1-101-882-00	360	1-102-821-00	0.0056	1-102-126-00
8	1-102-945-00	56	1-101-884-00	390	1-102-822-00	0.0068	1-102-127-00
9	1-102-946-00	62	1-101-886-00	430	1-102-823-00	0.0082	1-102-128-00
10	1-102-947-00	68	1-101-888-00	470	1-102-824-00	0.01	1-102-129-00
11	1-102-948-00	75	1-101-890-00	510	1-101-059-00	0.022	1-101-005-00
12	1-102-949-00	82	1-102-971-00	560	1-102-115-00	0.047	1-101-006-00
13	1-102-950-00	91	1-102-972-00	680	1-102-116-00		
15	1-102-951-00	100	1-102-973-00	820	1-102-117-00		
16	1-102-952-00	110	1-102-815-00				
18	1-102-953-00	120	1-102-816-00				
20	1-102-958-00	130	1-101-081-00				

0.001μF = 1,000pF

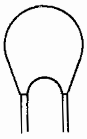
CERAMIC (SEMICONDUCTOR) CAPACITORS

			RATING	→: Use the high voltage rated one.	
CAP. (μF)	25 VOLT.	50 VOLT.	CAP. (μF)	25 VOLT.	50 VOLT.
	PART No.	PART No.		PART No.	PART No.
0.001	→	1-161-039-00	0.018	1-161-016-00	1-161-054-00
0.0012	→	1-161-040-00	0.022	1-161-017-00	1-161-055-00
0.0015		1-161-041-00	0.027	1-161-018-00	1-161-056-00
0.0018		1-161-042-00	0.033	1-161-019-00	1-161-057-00
0.0022		1-161-043-00	0.039	1-161-010-00	1-161-058-00
0.0027	→	1-161-044-00	0.047	1-161-021-00	1-161-059-00
0.0033	→	1-161-045-00	0.056	→	1-161-060-00
0.0039	→	1-161-046-00	0.068	→	1-161-061-00
0.0047	→	1-161-047-00	0.082	1-161-024-00	1-161-062-00
0.0056	→	1-161-048-00	0.1	1-161-025-00	1-161-063-00
0.0068	→	1-161-049-00			
0.0082	1-161-012-00	1-161-050-00			
0.01	1-161-013-00	1-161-051-00			
0.012	→	1-161-052-00			
0.015	1-161-015-00	1-161-053-00			

MYLAR CAPACITORS

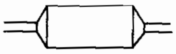
	RATING										
CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.	CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.	CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.
	PART No.	PART No.	PART No.		PART No.	PART No.	PART No.		PART No.	PART No.	PART No.
0.001	1-108-227-00	1-108-365-00	1-108-409-00	0.01	1-108-239-00	1-108-377-00	1-108-421-00	0.1	1-108-251-00	1-108-389-00	1-108-433-00
0.0012	1-108-351-00	1-108-366-00	1-108-410-00	0.012	1-108-357-00	1-108-378-00	1-108-422-00	0.12	1-108-363-00	1-108-390-00	1-108-434-00
0.0015	1-108-228-00	1-108-367-00	1-108-411-00	0.015	1-108-240-00	1-108-379-00	1-108-423-00	0.15	1-108-252-00	1-108-391-00	1-108-435-00
0.0018	1-108-352-00	1-108-368-00	1-108-412-00	0.018	1-108-358-00	1-108-380-00	1-108-424-00	0.18	1-108-364-00	1-108-392-00	1-108-436-00
0.0022	1-108-230-00	1-108-369-00	1-108-413-00	0.022	1-108-242-00	1-108-381-00	1-108-425-00	0.22	1-108-254-00	1-108-393-00	1-108-437-00
0.0027	1-108-353-00	1-108-370-00	1-108-414-00	0.027	1-108-359-00	1-108-382-00	1-108-426-00	0.27	1-108-854-00	–	–
0.0033	1-108-232-00	1-108-371-00	1-108-415-00	0.033	1-108-244-00	1-108-383-00	1-108-427-00	0.33	1-108-855-00	–	–
0.0039	1-108-354-00	1-108-372-00	1-108-416-00	0.039	1-108-360-00	1-108-384-00	1-108-428-00	0.39	1-108-856-00	–	–
0.0047	1-108-234-00	1-108-373-00	1-108-417-00	0.047	1-108-246-00	1-108-385-00	1-108-429-00	0.47	1-108-857-00	–	–
0.0056	1-108-355-00	1-108-374-00	1-108-418-00	0.056	1-108-361-00	1-108-386-00	1-108-430-00				
0.0068	1-108-237-00	1-108-375-00	1-108-419-00	0.068	1-108-249-00	1-108-387-00	1-108-431-00				
0.0082	1-108-356-00	1-108-376-00	1-108-420-00	0.082	1-108-362-00	1-108-388-00	1-108-432-00				

TANTALUM CAPACITORS



	RATING			→: Use the high voltage rated one.			
CAP. (μF)	3.15 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	25 VOLT.	35 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.01					→	→	1-131-396-00
0.015						→	1-131-397-00
0.022						→	1-131-398-00
0.033						→	1-131-399-00
0.047						→	1-131-400-00
0.068					→	→	1-131-401-00
0.1					→	→	1-131-402-00
0.15					→	→	1-131-403-00
0.22					→	→	1-131-404-00
0.33					→	1-131-409-00	1-131-405-00
0.47	–	–	–	–	1-131-412-00	→	1-131-406-00
0.68	–	–	–	1-131-415-00	→	1-131-410-00	1-131-407-00
1.0	–	–	1-131-418-00	–	1-131-413-00	→	1-131-408-00
1.5	–	1-131-421-00	–	1-131-416-00	→	1-131-411-00	1-131-348-00
2.2	1-131-424-00	–	1-131-419-00	–	1-131-414-00	1-131-355-00	1-131-349-00
3.3	–	1-131-422-00	–	1-131-417-00	1-131-362-00	1-131-356-00	1-131-350-00
4.7	1-131-425-00	–	1-131-420-00	1-131-369-00	1-131-363-00	1-131-357-00	1-131-351-00
6.8	–	1-131-423-00	1-131-376-00	1-131-370-00	1-131-364-00	1-131-358-00	1-131-352-00
10	1-131-426-00	1-131-383-00	1-131-377-00	1-131-371-00	1-131-365-00	1-131-359-00	1-131-353-00
15	1-131-390-00	1-131-384-00	1-131-378-00	1-131-372-00	1-131-366-00	1-131-360-00	–
22	1-131-391-00	1-131-385-00	1-131-379-00	1-131-373-00	1-131-367-00		
33	1-131-392-00	1-131-386-00	1-131-380-00	1-131-374-00			
47	1-131-393-00	1-131-387-00	1-131-381-00	–			
68	1-131-394-00	1-131-388-00	–	–			
100	1-131-395-00	–	–	–			

TANTALUM CAPACITORS



	RATING					
CAP. (μF)	3 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	35 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.033						1-131-273-00
0.047						1-131-274-00
0.068						1-131-275-00
0.1						1-131-276-00
0.15						1-131-277-00
0.22			–	–	1-131-262-00	1-131-278-00
0.33			–	–	1-131-263-00	1-131-279-00
0.47			1-131-169-00	–	1-131-264-00	1-131-280-00
0.68			–	1-131-258-00	1-131-265-00	1-131-281-00
1.0			1-131-254-00	–	1-131-266-00	1-131-282-00
1.5		1-131-250-00	–	–	1-131-267-00	1-131-283-00
2.2		–	–	1-131-259-00	1-131-268-00	1-131-284-00
3.3		–	1-131-255-00	–	1-131-269-00	–
4.7		1-131-251-00	1-131-171-00	–	1-131-270-00	–
6.8		–	–	1-131-260-00	1-131-271-00	–
10	–	–	1-131-256-00	–	1-131-272-00	–
15	–	1-131-252-00	–	1-131-261-00		
22	–	–	1-131-257-00	–		
33	1-131-176-00	1-131-253-00	1-131-173-00	–		
47	1-131-288-00	1-131-174-00	–	–		
100	1-131-177-00					

1/4 WATT CARBON RESISTORS

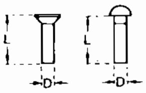
Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-476-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-477-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-478-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-479-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-480-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-481-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-482-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-483-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-484-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-485-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-486-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-487-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

HARDWARE NOMENCLATURE

Screw: – P 3 x 10

- *L: Length in mm*
- *D: Diameter in mm*
- *Type of head*
- *Indicated slotted-head only.*

Unless otherwise indicated, it means cross-recessed head (Phillips type).

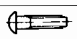
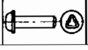
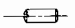
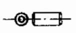
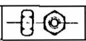
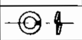


Reference Designation	Shape	Description	Remarks
		SCREWS	
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Nut, Washer, Retaining ring:

N 3

- *Diameter of usable screw or shaft*
- *Reference designation*

Reference Designation	Shape	Description	Remarks
		SELF-TAPPING SCREWS	
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
		SET SCREWS	
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
		NUT	
N		nut	
		WASHERS	
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
		RETAINING RINGS	
E		retaining ring	
G		grip-type retaining ring	

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